WHAT IS CLAIMED IS:

1. A power supply having a rectifying circuit rectifying AC power; an inverting part inverting the power rectified by the rectifying circuit to the inverted AC power and supplying the inverted AC power to a load, and including a first bridge and a second bridge connected to opposite ends of the rectifying circuit and having respective pairs of switching units serially connected to each other, the power supply comprising:

a control voltage signal generating part outputting a control voltage signal having alternating values corresponding to positive and negative values to control the AC power supplied from the inverting part to the load; and

a switching controller determining a sign of the control voltage signal, when the control voltage signal is determined to correspond to the positive values, and controlling one of the switching units of the first bridge to turn off and a remaining one of the switching units of the first bridge to turn on, and the switching units of the second bridge to alternately turn on and turn off corresponding to which one of an absolute value of the control voltage signal and of an absolute value of a predetermined comparison voltage signal is greater.

2. The power supply according to claim 1, wherein the switching controller controls, when the control voltage signal is determined to correspond to the negative values, the one of the switching units of the second bridge to be off and the remaining one of the switching units of the second bridge to be on, and the switching units of the first bridge to alternately turn on and turn off corresponding to which one of the absolute value of the control voltage signal and an absolute value of the predetermined comparison voltage signal is greater.

3. The power supply according to claim 1, wherein the switching controller comprises:

a comparison signal generating part outputting a voltage compared signal having a logical value corresponding to a determination result by determining which one of absolute values of the control voltage signal and the predetermined comparison voltage signal is greater;

a sign signal generating part outputting a control voltage sign signal having a logical value corresponding to positive and negative signs of the control voltage signal; and

a switching control signal generating part logically calculating the voltage compared signal and the control voltage sign signal and outputting switching control signals to turn on and turn off the respective switching units of the first bridge and of the second bridge.

4. The power supply according to claim 3, wherein the switching control signal generating part comprises:

a dead time generating part receiving the voltage compared signal and outputting a first switching signal and a second switching signal having a dead time relative to the voltage compared signal; and

a logical operation circuit part logically calculating the control voltage sign signal, the first switching signal and the second switching signal and outputting the switching control signals.

5. The power supply according to claim 4, wherein the first switching signal and the second switching signal outputted from the dead time generating part have logical values opposite to each other.

6. The power supply according to claim 5, wherein the sign signal generating part outputs the control voltage sign signal having a first logical value when the control voltage signal correspond to the positive values, and outputs a control voltage sign signal having a second logical value when the control voltage signal corresponds to the negative values.

7. The power supply according to claim 6, wherein respective ones of the switching units of the first bridge and of the second bridge are provided as upper arm switching units connected to a voltage output end of the rectifying circuit and as lower arm switching units connected to a voltage input end of the rectifying circuit, and

the logical operation circuit part outputs the switching control signals allowing the lower arm switching unit of the first bridge to turn on, the upper arm switching unit of the first bridge to turn off, the upper arm switching unit of the second bridge to turn on and turn off corresponding to the first switching signal, and the lower arm switching unit of the second bridge to turn on and turn off corresponding to the second switching signal, while the control voltage sign signal is at the first logical value.

8. The power supply according to claim 7, wherein the logical operation circuit part outputs the switching control signals allowing the lower arm switching unit of the second bridge to turn on, the upper arm switching unit of the second bridge to turn off, the upper arm switching unit of the first bridge to turn on and turn off corresponding to the first switching signal, and the lower arm switching unit of the first bridge to turn on and turn off corresponding to the second switching signal, while the control voltage sign signal is at the second logical value.

9. The power supply according to claim 2, wherein the switching controller comprises:

a comparison signal generating part outputting a voltage compared signal having a logical value corresponding to a determination result by determining which one of absolute values of the control voltage signal and the comparison voltage signal is greater;

a sign signal generating part outputting a control voltage sign signal having a logical value corresponding to positive and negative signs of the control voltage signal; and

a switching control signal generating part outputting switching control signals to turn on and turn off respective ones of the switching units of the first bridge and of the second bridge by logically calculating the voltage compared signal and the control voltage sign signal.

10. The power supply according to claim 9, wherein the switching control signal generating part comprises:

a dead time generating part receiving the voltage compared signal and outputting a first switching signal and a second switching signal having a dead time relative to the voltage compared signal; and

a logical operation circuit part logically calculating the control voltage sign signal, the first switching signal and the second switching signal and outputting the switching control signals.

11. The power supply according to claim 10, wherein the first switching signal and the second switching signal outputted from the dead time generating part have logical values opposite to each other.

12. The power supply according to claim 11, wherein the sign signal generating part outputs the control voltage sign signal having a first logical value when the control voltage signal correspond to the positive values, and outputs the control voltage sign signal having a second logical value when the control voltage signal corresponds to the negative values.

13. The power supply according to claim 12, wherein respective ones of switching units of the first bridge and of the second bridge are provided as upper arm switching units connected to a voltage output end of the rectifying circuit and as lower arm switching units connected to a voltage input end of the rectifying circuit, and

the logical operation circuit part outputs the switching control signals allowing the lower arm switching unit of the first bridge to turn on, the upper arm switching unit of the first bridge to turn off, the upper arm switching unit of the second bridge to turn on and turn off corresponding to the first switching signal, and the lower arm switching unit of the second bridge to turn on and turn off corresponding to the second switching signal, while the control voltage sign signal is at the first logical value.

14. The power supply according to claim 13, wherein the logical operation circuit part outputs the switching control signals allowing the lower arm switching unit of the second bridge to turn on, the upper arm switching unit of the second bridge to turn off, the upper arm switching unit of the first bridge to turn on and turn off corresponding to the first switching signal, and the lower arm switching unit of the first bridge to turn on and turn off corresponding to the second switching signal, while the control voltage sign signal is at the second logical value.

15. A control method of a power supply having a rectifying circuit rectifying AC power; an inverting part inverting the power rectified by the rectifying circuit to an inverted AC power and supplying the inverted AC power to a load, and comprising a first bridge and a second bridge connected to opposite ends of the rectifying circuit and having respective pairs of switching units serially connected to each other, the method comprising:

generating a control voltage signal having alternating values corresponding to negative and positive values to control the AC power supplied from the inverting part to the load;

determining whether the control voltage signal corresponds to the positive values or the negative values;

outputting a voltage compared signal having a logical value corresponding to which one of absolute values of the control voltage signal and a predetermined comparison voltage signal is greater; and

controlling one of the switching units of the first bridge to turn on, a remaining one of the switching units of the first bridge to turn off, and the switching units of the second bridge to alternately turn on and turn off corresponding to the voltage compared signal when the control voltage signal is determined to correspond to the positive values.

16. The control method of the power supply according to claim 15, further comprising:

controlling one of the switching units of the second bridge to turn off, the remaining one of the switching units of the second bridge to turn on, and the switching units of the first bridge to alternatively turn on and turn off corresponding to the voltage compared signal when the control voltage signal is determined to correspond to the negative values.

17. A power supply having a rectifying circuit rectifying AC power including first and second bridges connected in parallel to opposite ends of the rectifying circuit and each having a pair of switching units serially connected to each other, comprising:

a switching controller controlling a switching sequence of the switching units corresponding to which one of an absolute value of a control signal and of an absolute value of a predetermined comparison signal is greater, when the control signal is determined to correspond to positive values, by switching off one of the switching units of the first bridge and switching on a remaining one of the switching units of the first bridge, and by alternately switching on and switching off the switching units of the second bridge.

18. The power supply according to claim 17, wherein, when the control signal is determined to correspond to negative values, the switching controller controls the one switching unit of the second bridge to be off and the remaining switching unit of the second bridge to be on, and alternately switches on and switches off the switching units of the first bridge corresponding to which one of the absolute values of the control signal and of the predetermined comparison signal is greater.

19. The power supply according to claim 17, wherein the switching controller comprises:

a signal generating part outputting a compared signal having a logical value corresponding to a result of determining which one of the absolute values of the control signal and the predetermined comparison signal is greater;

a sign signal generating part outputting a sign signal having a logical value corresponding to positive and negative signs in accordance with the positive and negative values of the control signal; and

a switching signal generating part calculating the compared signal and the sign signal and outputting switching control signals to turn on and turn off the respective switching units of the first and second bridges.

20. The power supply according to claim 19, wherein the switching signal generating part comprises:

a dead time generating part receiving the compared signal and outputting first and second switching signals having a dead time relative to the compared signal; and

a logic part calculating the sign signal, the first switching signal and the second switching signal and outputting the switching control signals.

21. The power supply according to claim 20, wherein the first and second switching signals outputted from the dead time generating part have logical values opposite to each other.

22. The power supply according to claim 21, wherein the sign signal has a first logical value when the control signal corresponds to the positive values, and a second logical value when the control signal corresponds to the negative values.

23. The power supply according to claim 22, wherein respective ones of the switching units of the first and second bridges are provided as upper arm switching units connected to an output end of the rectifying circuit and as lower arm switching units connected to an input end of the rectifying circuit, and

the logic part outputs the switching control signals to switch on the lower arm switching unit of the first bridge, to switch off the upper arm switching unit of the first bridge, to switch on and switch off the upper arm switching unit of the second bridge corresponding to the first switching signal, and to switch on and switch off the lower arm switching unit of the second bridge corresponding to the second switching signal, while the sign signal is at the first logical value.

24. The power supply according to claim 23, wherein the logic part outputs the switching control signals to switch on the lower arm switching unit of the second bridge, to switch off the upper arm switching unit of the second bridge, to switch on and switch off the upper arm switching unit of the first bridge corresponding to the first switching signal, and to switch on and switch off the lower arm switching unit of the first bridge corresponding to the second switching signal, while the sign signal is at the second logical value.

25. The power supply according to claim 18, wherein the switching controller comprises:

a signal generating part outputting a compared signal having a logical value corresponding to a result of determining which one of the absolute values of the control signal and the predetermined comparison signal is greater;

a sign signal generating part outputting a sign signal having a logical value corresponding to positive and negative signs in accordance with the positive and negative values of the control signal; and

a switching signal generating part outputting switching control signals to turn on and turn off respective ones of the switching units of the first and second bridges by calculating the compared signal and the sign signal.

26. The power supply according to claim 25, wherein the switching signal generating part comprises:

a dead time generating part receiving the compared signal and outputting first and second switching signals having a dead time relative to the compared signal; and

a logic part calculating the sign signal, the first switching signal and the second switching signal and outputting the switching control signals.

27. The power supply according to claim 26, wherein the first and second switching signals outputted from the dead time generating part have logical values opposite to each other.

28. The power supply according to claim 27, wherein the sign signal has a first logical value when the control signal corresponds to the positive values, and a second logical value when the control signal corresponds to the negative values.

29. The power supply according to claim 28, wherein respective ones of switching units of the first and second bridges are provided as upper arm switching units connected to an output end of the rectifying circuit and as lower arm switching units connected to an input end of the rectifying circuit, and

the logic part outputs the switching control signals to switch on the lower arm switching unit of the first bridge, to switch off the upper arm switching unit of the first bridge, to switch on and to switch off the upper arm switching unit of the second bridge corresponding to the first switching signal, and to switch on and to switch off the lower arm switching unit of the second bridge corresponding to the second switching signal, while the sign signal is at the first logical value.

30. The power supply according to claim 29, wherein the logic part outputs the switching control signals to switch on the lower arm switching unit of the second bridge, to switch off the upper arm switching unit of the second bridge, to switch on and to switch off the upper arm switching unit of the first bridge corresponding to the first switching signal, and to switch on and to switch off the lower arm switching unit of the first bridge corresponding to the second switching signal, while the sign signal is at the second logical value.

31. The power supply according to claim 17, wherein each of the switching units is a transistor.

32. The power supply according to claim 24, wherein the switching controller outputs the switching control signals to respective ones of the switching units such that a first switching control signal outputted to the upper arm switching unit of the second bridge is a logical sum of an inverse of a logical value of the sign signal and a logical value of the first switching signal, a second switching control signal outputted to the lower arm switching unit of the second bridge is a logical sum of the logical value of the sign signal and the logical value of the first switching signal, a third switching control signal outputted to the upper arm switching unit of the first bridge is a logical product of the logical value of the sign signal and a logical value of the second switching signal, and the fourth switching control signal outputted to the lower arm switching unit of the first bridge is a logical product of an inverse of the logical value of the sign signal and the logical value of the second switching signal.

33. A control method of a power supply having a rectifying circuit rectifying AC power including first and second bridges connected in parallel to opposite ends of the rectifying circuit and each having a pair of switching units serially connected to each other, comprising:

generating a control signal having values corresponding to positive and negative values to control the power supplied to a load;

determining whether the control signal corresponds to the positive values or the negative values;

outputting a compared signal having a logical value corresponding to which one of absolute values of the control signal and a comparison signal is greater; and

controlling one of the switching units of the first bridge to switch on, a remaining one of the switching units of the first bridge to switch off, and the switching units of the second bridge to alternately switch on and switch off corresponding to the compared signal when the control signal is determined to correspond to the positive values.

34. The control method of the power supply according to claim 33, further comprising:

controlling the one switching unit of the second bridge to switch off, the remaining switching unit of the second bridge to switch on, and the switching units of the first bridge to alternately switch on and switch off corresponding to the compared signal when the control signal is determined to correspond to the negative values.

35. A control method of a power supply having a rectifying circuit rectifying AC power including first and second bridges connected in parallel to opposite ends of the rectifying circuit and each having a pair of switching units serially connected to each other, comprising:

determining whether the control signal corresponds to positive values or negative values;

outputting a compared signal having a logical value corresponding to which one of absolute values of the control signal and of a predetermined comparison signal is greater; and

controlling a switching sequence of the switching units corresponding to which one of an absolute values of a control signal and of the predetermined comparison signal is greater such that, when the control signal is determined to correspond to the positive values, switching off one of the switching units of the first bridge and switching on a remaining one of the switching units of the first bridge, and alternately switching on the switching units of the second bridge and, when the control signal is determined to correspond to the negative values, the one switching unit of the second bridge being off and the remaining switching unit of the second bridge being on, and alternately switching on and switching off the switching units of the first bridge.

36. A power supply having a rectifying circuit rectifying AC power including a first bridge and a second bridge connected to opposite ends of the rectifying circuit and having respective pairs of switching units serially connected to each other, comprising:

a signal generating part outputting a signal having values corresponding to positive and negative values to control the power supply; and

a switching controller, when the signal is determined to correspond to the positive values, controlling one of the switching units of the first bridge to turn off and a remaining one of the switching units of the first bridge to turn on, and controlling one of the switching units of the second bridge to turn on and a remaining one of the switching units of the second bridge to turn off corresponding to which one of absolute values of the signal and of a predetermined comparison signal is greater.